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ABSTRACT

The influence of students' self-efficacy (perceived capabilities) on their motivation and skill acquisition is discussed, focusing on the role of classroom models. Social-cognitive learning theory suggests that observations of peers performing academic tasks may affect the learners' efficacy partly through the intervening influence of perceived similarity in competence, and that student capability differences may influence perceived similarity. Research is summarized showing that students with skill deficiencies judge themselves more similar in competence to coping models than to mastery models, and that observing coping models enhances their self-efficacy and skills to a greater extent than does observing mastery models. In contrast, normal achievers judge themselves more competent than coping models (peers) who verbalize negative beliefs and equal in competence to mastery models and to coping models who do not verbalize negative beliefs. Future research might investigate familial influences on students' receptiveness to contextual factors, underminers of perceived efficacy, and developmental changes in ability to learn from models. (Author/SLD)

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Perceptions of Efficacy and Classroom Motivation

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Abstract

This paper discusses the influence of students' self-efficacy (perceived capabilities) on their motivation and skill acquisition. I focus this discussion on the role of classroom models. Social-cognitive learning theory suggests that observations of peers performing academic tasks may affect learners' efficacy partly through the intervening influence of perceived similarity in competence and that student capability differences may influence perceived similarity. Research is summarized showing that students with skill deficiencies judge themselves more similar in competence to coping than to mastery models and that observing coping models enhances their self-efficacy and skills better than mastery models. In contrast, normal achievers judge themselves more competent than coping models who verbalize negative beliefs and equal in competence to mastery models and to coping models who do not verbalize negative beliefs. Future research might investigate familial influences on students' receptiveness to contextual factors, underminers of perceived efficacy, and developmental changes in ability to learn from models.

Perceptions of Efficacy and Classroom Motivation

In this paper I discuss the influence of learners' perceptions of efficacy (perceived capabilities) on their motivation and skill acquisition. I focus on the role of models to include how observations of models affect students' perceived efficacy and how individual differences in students' competencies can moderate these effects. This focus derives from theory and research showing that students are active seekers and processors of information and that their learning is a function of interactions between personal, social, and instructional variables (Corno & Snow, 1986; Pintrich, Cross, Kozma, & McKeachie, 1986). Observation of models can affect students in many ways; however, these effects are complex and may depend on students' capabilities relative to those of the models.

I initially summarize theory on perceived efficacy and modeling. Key points are that observations of models performing academic tasks may affect observers' efficacy through the intermediate influence of perceived similarity in competence and that student capability differences can affect perceptions of similarity. Some research evidence is offered to support these points, and I conclude with suggestions for future research.

Background

Perceived self-efficacy refers to personal beliefs about one's capabilities to attain designated performance levels (Bandura, 1986). Self-efficacy is hypothesized to affect choice of activities, effort expenditure, and persistence. Students with low self-efficacy for accomplishing a task may avoid it; those who believe they are capable are more likely to participate. Especially when facing obstacles, students who feel they can perform well ought to work harder and persist longer than those who doubt their capabilities. Individuals acquire information to gauge their self-efficacy from their actual performances, vicarious (observational)

experiences, forms of persuasion, and physiological indexes (e.g., heart rate, sweating). As a cognitive mechanism affecting instigation, direction, and persistence of achievement behaviors, self-efficacy fits well with the emphasis placed by various theoretical traditions on students' beliefs concerning their capabilities to control important aspects of their lives (Bandura, 1986; Corno & Mandinach, 1983; Dweck & Leggett, 1988; Nicholls, 1983; Stipek & Weisz, 1981; Thomas, 1980; Weiner, 1985).

During academic learning activities, students differ in their initial beliefs about their capabilities to acquire knowledge, perform skills, master the material, and so forth (Schunk, 1989). These efficacy differences presumably vary due to prior educational experiences and such personal characteristics as abilities and attitudes. Self-efficacy is altered while students are engaged with academic material; cues derived from contextual (social, instructional) variables signal students about their progress in learning. Cues include performance outcomes, outcome patterns, attributions, social comparisons, persuader credibility, and bodily symptoms. The belief that they are acquiring skills raises learners' self-efficacy and promotes their motivation and skill development.

Social comparisons with peers constitute an important cue used by learners to gauge learning progress and appraise self-efficacy. Festinger (1954) hypothesized that, when objective standards of behavior are unclear or unavailable, observers evaluate themselves through comparisons with others, and that the most accurate self-evaluations derive from comparisons with those similar in the ability or characteristic being evaluated. Peer models, or those roughly equivalent in development to observers, have the potential to affect students in many ways (Schunk, 1987).

Observations of peers are informative and motivating (Bandura, 1986). Vicarious consequences convey information to observers about the <u>functional</u>

value of behavior, or whether it results in success or failure, reward or punishment. Observing competent models conveys to learners the sequence of actions one should use to succeed and allows them to formulate outcome expectations, or beliefs about the expected outcomes of actions. An important mechanism influencing outcome expectations is perceived similarity to models. The more alike observers are to models, the greater is the probability that similar actions by observers will produce comparable results. Similarity ought to be highly influential when observers have little information about functional value; for example, modeled behaviors on tasks with which students are unfamiliar or those not immediately followed by consequences.

The motivational effects of observation of models presumably depend in part on self-efficacy. Model similarity provides information for gauging efficacy. Observing similar others succeed at a task can raise observers' efficacy and motivate them to try the task, because they are apt to believe that if others can succeed they can as well. Observing similar others fail can lead learners to believe they also may lack the competencies to succeed, which can dissuade them from attempting the task. Similarity may be highly influential when learners lack task familiarity and have little information on which to base efficacy appraisals or when they previously have experienced difficulties and doubt their capabilities (Schunk, 1987).

These considerations suggest that observations of peers performing academic tasks may affect learners' efficacy partly through the intermediate influence of perceived similarity in competence. Students who perceive themselves as similar in competence to or more competent than successful models are likely to believe that they, too, can succeed at the task. The belief that one is less capable than successful models should not raise one's efficacy as well. Students who perceive themselves as more competent than unsuccessful peers may nonetheless feel efficacious about learning, whereas

those who believe they are of equal or lower competence than unsuccessful models are apt to doubt their capabilities for succeeding.

Within this context, student capability differences may influence perceived similarity. Students with average and high aptitudes for learning expect to succeed in school and generally do so. They are likely to feel efficacious about learning and improving their skills. Observations of successful peers should enhance their efficacy for learning. They are apt to perceive themselves similar in competence to successful peers who acquire skills readily. In contrast, students with lower learning aptitudes often experience learning difficulties and doubt their capabilities. To the extent such students believe they are more similar in competence to less-competent models whose learning is characterized by difficulties and gradual improvements than to peers who demonstrate rapid mastery, the former models should better enhance students' sense of efficacy for learning.

Research Evidence

In this section I summarize research that bears on the preceding considerations. An early study compared the effects of mastery and coping models (Schunk & Hanson, 1985). Coping models initially demonstrate the typical fears and deficiencies of observers but gradually improve their performance and gain self-confidence. Such models illustrate how determined effort and positive self-thoughts can overcome difficulties (Thelen, Fry, Fehrenbach, & Frautschi, 1979). Mastery models demonstrate faultless performance and high confidence from the outset. Among students who view coping models' initial difficulties and gradual progress similar to their typical performances, such models might better promote efficacy for learning than mastery models.

Subjects were elementary school children who had experienced problems learning subtraction with regrouping. These students, though low achievers,

were not receiving remedial instruction at the time of the study. Children observed videotapes portraying an adult teacher and a same-sex peer (student) mastery or coping model. The teacher repeatedly explained and demonstrated operations, after which the model solved problems. The mastery model easily grasped subtraction operations, solved all problems correctly, and verbalized achievement beliefs reflecting high self-efficacy (e.g., "I can do that one"), high ability ("I'm good at this"), low task difficulty ("That looks easy"), and positive attitudes ("I like doing these"). The coping model initially made errors and verbalized negative beliefs, but gradually made fewer errors and began verbalizing coping statements ("I'll have to work hard on this one"). The coping model's problem-solving behaviors and verbalizations eventually matched those of the mastery model. After viewing the tapes, children judged perceived similarity in competence to the model. Other students viewed videotapes that portrayed only the teacher, and some students observed no tapes. All students judged self-efficacy for learning to subtract and received subtraction instruction over sessions.

Observing a peer model enhanced efficacy for learning better than observing a teacher model or no model; teacher-model students judged efficacy higher than no-model children. On posttest measures of efficacy and skill, peer-model subjects outperformed teacher-model and no-model children; the teacher-model condition scored higher than the no-model condition. There was no difference between mastery and coping model conditions, which may have been due to students' prior experiences with subtraction. Though their successes were limited to problems without regrouping, they had these experiences to draw on and may have concluded that if the peer model could learn to regroup, they could as well. Students may have focused more on what models had in common (task success) than on differences (rate of learning, number of errors, type of verbalized beliefs).

In follow-up research comprising two experiments (Schunk, Hanson, & Cox, 1987), low-achieving children who had experienced few, if any, successes with fractions, observed videotapes portraying a peer model demonstrate either rapid (mastery model) or gradual (coping model) acquisition of skill in adding and subtracting fractions. These subjects previously had been classified by the school district as working below grade level in mathematics. Given children's lack of prior successes with fractions, we expected they would perceive the coping model's performance more similar to their own and thereby feel more capable of learning. In the first experiment, children who observed a peer coping model judged themselves more similar in competence to the model compared with children who observed a mastery model. Coping-model children also judged self-efficacy for acquiring fractions skills higher, solved more problems during the instructional sessions (a measure of motivation), and demonstrated higher posttest self-efficacy and skills, compared with mastery-model children.

In the second experiment, children observed one or multiple coping or mastery models. A presumed benefit of multiple models is that they increase the probability that observers will perceive themselves as similar to at least one model (Thelen et al., 1979). Children who observed coping models judged themselves more similar in competence to the models than those who observed mastery models; however, perceived similarity did not relate to achievement outcomes. Learners in the single coping model, multiple coping model, and multiple mastery model conditions solved more problems during the instructional sessions and demonstrated higher posttest self-efficacy and skills than children in the single mastery model condition. Observation of several peers succeeding was sufficient to instill a sense of learning efficacy in children.

To further explore the idea that differences in students' mathematical competencies can moderate effects of peer models on achievement beliefs and behaviors, we conducted a study with students classified by the school district as working on-grade level in mathematics (Schunk & Hanson, 1989a). As discussed in the preceding section, we felt that such children might benefit more from observing mastery rather than coping models. We also added a second coping-model condition (coping-alone model) that was identical to the other coping treatment (coping-emotive model) except that the model never verbalized negative beliefs. Coping-alone models verbalized coping statements until their problem-solving behaviors improved, after which they verbalized positive beliefs. We were interested in testing Bandura's (1986) contention that modeled coping techniques raise self-efficay better than negative emotive statements. The latter may increase perceived similarity among low achievers, but could lead normal learners to view the task as difficult and to doubt their learning capabilities.

Children assigned to the coping-emotive model condition judged self-efficacy for learning the highest, but there was no difference in posttest self-efficacy among the mastery model, coping-alone model, and coping-emotive model conditions. Mastery and coping-alone children perceived the model as competent and themselves as equally competent; coping-emotive children judged the model's competence as low and themselves as more competent. No diffences were found due to number of models. Though observing a peer having difficulty and verbalizing negative statements influenced children's perceptions of model competence, similarity, and self-efficacy for learning, it was children's actual performances during the instructional sessions that affected their posttest self-efficacy and skills. Let me add that this situation may not be instructionally desirable. Observing coping-emotive models may lead normal learners to overestimate their

competence. If children subsequently encounter learning difficulties, they might begin to doubt their capabilities, which will negatively affect motivation and skill acquisition.

We also have obtained evidence for comparable effects on children's self-efficacy due to their observing videotapes of their own successful performances (self-modeling) (Schunk & Hanson, 1989b). The subjects were children who had been classified by the school district as working below grade level in mathematics. We expected to obtain self-modeling effects with these low achievers. The observation of oneself performing well ought to convey that one has made progress in learning, which can raise self-efficacy (Dowrick, 1983; Hosford, 1981). Self-model tapes may be especially useful with low achievers, who otherwise might wonder how well they are acquiring skills.

Some children were videotaped solving fraction problems successfully, after which they viewed their tapes. Other children observed multiple peer models successfully solve fraction problems. Children in a third condition received both treatments, and others received instruction but no exposure to peer or self-models. All children initially completed a measure of self-efficacy for learning fraction skills, and later on a measure of perceived progress in learning to solve fractions.

Observation of peer models raised children's judgments of self-efficacy for learning, whereas observation of self-model tapes enhanced children's perceptions of progress. The peer-model, self-model, and peer- + self-model conditions did not differ in the number of problems solved during the instructional sessions or on posttest efficacy and skill, but each condition outperformed the controls. Consistent with the results of Schunk et al. (1987), multiple peer models exerted strong effects on achievement beliefs and

behaviors, but these effects were comparable to those due to children watching themselves perform masterfully.

Summary. These studies support the idea that differences in students' capabilities to acquire mathematical skills can moderate the effects of various model attributes on students' achievement beliefs, motivation, and skill acquisition. Among students with mathematical deficiencies, observing coping models enhances self-efficacy and skills better than observing mastery models when content is new or students have had few successes with it. Such low achievers judge themselves similar in competence to coping models. These benefits of coping models can be outweighed by successful experiences with the content and by exposure to multiple models. We also have found benefits from exposing such children to tapes portraying their own successful performances.

Our data further suggest that normally-achieving children may interpret the difficulties and gradual successes of coping models as indicating lower competence. Such children judge themselves more competent than coping models who verbalize negative beliefs and equal in competence to coping models who do not verbalize such beliefs and to mastery models. Consistent with Bandura's (1986) contention that vicarious sources of efficacy information can be outweighed by actual performances, children's experiences subsequent to observing models provides them with more task information and a better basis for gauging self-efficacy.

Future Research

The studies summarized in this paper suggest the need for additional research on the role of perceived similarity in competence. Similarity seems more influential when children have limited task experience to use in gauging self-efficacy for learning. As children gain experience, such vicarious sources of efficacy information as peer models may exert less-powerful effects on children's achievement beliefs. Similarity also does not seem as important

when children are exposed to multiple models--a situation common in schools. Even low achievers are likely to feel efficacious about mastering a task when they observe several successful peers. Future research might examine the role of perceived similarity as affected by differences in students' abilities and prior experiences, model characteristics, and task features (e.g., difficulty).

I recommend that a future research agenda also assess the following factors to determine whether they can moderate the effects of models and other contextual variables on students' self-perceptions.

Familial influences. Research is increasingly examining the role of families on students' learning and motivation in school (Epstein, 1989). Beginning in infancy, familial interactions affect children's perceived efficacy for developing competencies, which influences children's willingness to approach new tasks (Bandura, 1986). Students enter school differing in many ways that relate to school learning; for example, their capacity for self-direction and autonomous learning. Research is needed to determine how families may affect students' achievement beliefs and their receptivity to various classroom contextual variables.

Underminers of perceived efficacy. Much has been written about how such classroom variables as extrinsic rewards, competition, and ability grouping, can have negative effects on students' intrinsic motivation, classroom goals and attitudes (Lepper & Hodell, 1989; Nicholls, 1983). An underlying factor is social comparisons of abilities; children who earn few rewards and are placed in groups with slow learners are apt to develop doubts about their capacities for performing well in school. Such negative perceptions, once established, are not easily changed. Recent research is examining the effects of students' perceptions of these and other practices on their beliefs and academic expectations (Weinstein, 1989). This focus should be extended to

determine how students with negative perceptions react to classroom reforms (e.g., self-referenced appraisals) designed to promote a sense of efficacy for learning in school.

Developmental changes. Developmental factors should influence the cues that students derive from classroom variables and how students cognitively process those cues to form and alter perceptions of self-efficacy (Schunk, 1989). Research is needed on each of these aspects. With development, for example, children become better able to attend to models for longer times. This suggests that long modeled demonstrations may not influence children's perceptions of efficacy better than shorter ones.

Such research also could examine children's reactions to peer and teacher models. Though children's ability to learn from peers increases with development, even young children learn well from peers (Hartup & Lougee, 1975). Developmental research examining effects of models on self-efficacy also would have important instructional implications, since the results would suggest ways to incorporate peers into instruction to enhance children's skills and achievement beliefs.

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